

## VALIDITY OF LADDER SNAKE MEDIA TO TRAIN COOPERATION AND ENHANCE LEARNING OUTCOME OF STUDENTS ON DIGESTIVE SYSTEM

**Nanik Indra Rukmana**

Biology Departement, Faculty of Mathematics and Natural Science,  
Universitas Negeri Surabaya  
nanikrukmana@mhs.unesa.ac.id

**Isnawati**

Biology Departement, Faculty of Mathematics and Natural Science,  
Universitas Negeri Surabaya  
isnawati@unesa.ac.id

### Abstract

Learning plays a role in determining students learning mastery. One of the element in the mastery of learning is cooperation. Cooperation is very closely related to the survival of human life. Learning also make positive contribution to better improvement. One of the improvement that can be measured is learning outcome. The learning outcome is measurement tool to know the accuracy of learning strategy and as the reflection to learning that has been done. Digestive system is one of the material that has many provision. This material commonly uses powerpoint slide, lecture and discussion. This does not suit with the idea of 2013 Curriculum. In the 2013 Curriculum changes the learning pattern to be student-centered. The alternative solution of this problem is using variation in learning. One of the variation that can be done is learning media. Learning media that can assess the cooperation, learning outcome and fits the 2013 curriculum is digestive system ladder snake media. The aim of this study was to produce feasible digestive system snake ladder based on its validity. The procedure of this result used ASSURE model (Analyzing learners, State media objectives, Selecting method and media materials, Utilizing materials, Requiring learners performance, and Evaluating/Revising). The limited test was carried out to 30 students of Grade XI in SMA Negeri 1 Bojonegoro. Validity of media was determined based on the validation result by the media and material experts. The validity score was 3.95 in very valid category. Based on that validity score, the developed digestive system ladder snake media was stated as feasible.

**Keywords** : *Validity, Ladder Snake Media, Learning Outcome, Cooperation, Digestive System.*

### INTRODUCTION

Learning plays a role in determining students learning mastery. One of the element in mastery learning is cooperation. Through cooperation students can do a lot of activity and skills (Nurnawati *et al.*, 2012). In fact, cooperation is an interaction or relationship that is dynamic for a common goal. Understanding cooperation according to Soekanto (2006) is an effort between either individuals or groups in achieving a specific goal. Cooperation is very closely related to the survival of human life.

It can be said that the learning process is effective and efficient when students experienced a better change in the improvement of learning outcomes. Learning outcomes is the measurement tool for the teachers to find out the accuracy of learning strategy that is used and as the self-reflection of learning which they has been done (Jaeng, 2007). The effectiveness and efficiency of learning can be done with the help of learning media. As an educator, teachers are required to

develop innovation and creativity in the process of delivering the material.

The uses of media, various learning resources and fits with the stage of students development can hold a more variation to students, so that the learning process will be happier (Nugroho *et al.*, 2013; Sigh, 2014). Similar statements are also expressed by Noemi & Maximo (2014) that the learning media can be a stimulant for students to exchange perception and knowledge so that students would be easier to receive learning material. A fun learning atmosphere can be supported by the learning media innovation such as games (Chaudhary, 2010).

The media selection should be adjusted to learning purpose or competence that want to be achieved (Umar, 2013). There is basic competence that has to be achieved in 2013 Curriculum, especially in digestive system material. Digestive systems is one of the materials that has broad coverage, terms and

mechanisms must be understood and develop by students in biology 11th-grade of high school (Permatasari *et al.*, 2013). The material is closely related to the daily life and directly relates to the students (Pramita *et al.*, 2014). This material asks the student to understand, analyze and synthesize the term of digestive organs and its process.

Based on the interview results in August 2017 with biology teachers, the material that has a low mastery standard is the Digestive System. On the material digestive system, there is a lot of memorizing and learning methods that are less attractive. Teachers also added that the condition of the 11th-grade students is an active student who is organizing in club so that they are often busy working on other stuffs in other time. The situation has an impact on their biology score, which is being not maximal and does not meet the minimum completion criteria (KKM) that have been established by the school which is 80. This is evidenced by the low and the lack of student learning outcomes because of the understanding that hasn't been completed. The condition is caused by limited creations and innovations of teachers because it is only focused by the orientation of the curriculum that is seen from the completion of the material.

Learning methods that are teacher-oriented tend to ignore the rights and needs, as well as growth and development of children so that the learning process should be fun, exciting and educating became less optimal. In the research that has been carried out by Rizkiyah *et al.*, (2015) that similar problems are also found in SMAN 1 Sooko Mojokerto. The students have difficulty in the digestive system material. The difficulty is caused by the amount of memorizing and less interesting learning that is textbook-oriented only and the students tend to do other activities outside of the learning activities.

The concept of a material will be more easily understood when using learning tools (Nugrahani, 2007). One of the learning media that can be used as a teaching tool is a ladder snake media. The ladder snake media is one of the traditional Indian games and can be found in other countries (Shitiq & Mahmud, 2010). This game is included into the group games category, so the game is perfectly fits to be combined with group discussions (Karimah, 2014).

The use of ladder snake media can make students happy, active and teachers can act as facilitators and can train students to work together and compete healthily in

the class (Kurnianita, 2016; Purwaningsih & Siti, 2017). Understanding the material well can affect students learning outcomes. Student learning outcomes will be improved by optimizing the learning media of this ladder snake media. Ladder snake media is expected to improve students understanding in digestive system material. Through group discussion that can train cooperation and improve student learning outcomes. Based on that description, the media needs to be developed so the ladder snake media can train student cooperation and improve learning outcomes on digestive system material. The purpose of this research is to produce a proper ladder snake media of the digestive system based on the validation of the experts.

## METHOD

This research is a development research which purpose is to find out the feasibility of media based on the validity. Feasibility assessment conducted by media experts, media materials and biology teacher. The tabulation of the validation data score was collected by grouping the details of a statement in accordance with the observed aspects using Likert scale 1-4. Validation of the calculation results based on an average of every assessment aspects, the average score each of the reviewers, the mode of score, the feasibility of each aspect, the feasibility of each validator, as well as the average score on the overall aspect.

The method used in this study is ASSURE. The ASSURE steps were Analyzing learners, State media objectives, Selecting method and media materials, Utilizing materials, Requiring learners performance, and Evaluating/Revising. The target of this research is the students of 11th-grade SMA Negeri1 Bojonegoro on academic year of 2017-2018 with 30 heterogeneous students. Digestive system ladder snake media would be declared feasible if it got score average  $> 2.51$  and percentage of the result of assessment equal to  $\geq 70\%$  (Riduwan, 2010).

## RESULT

### a. The Profil Of Digestive System Ladder Snake Media

Digestive system ladder snake media uses several components. The components are paper ladder snake media, clue games, question card, answer cards, dice and a pawn. Paper of ladder snake media has a size of  $50 \times 50 \text{ cm}^2$  fitted 36 boxes in Figure 1.



Figure 1. Design of Digestive System Ladder Snake Media

The other component are question and answer cards, this card contains questions and answers relating to the material of the digestive system. The acquisition score is determined by the points stated in the card questions and answers. The card questions and answer is stated in Figure 2 and Figure 3.

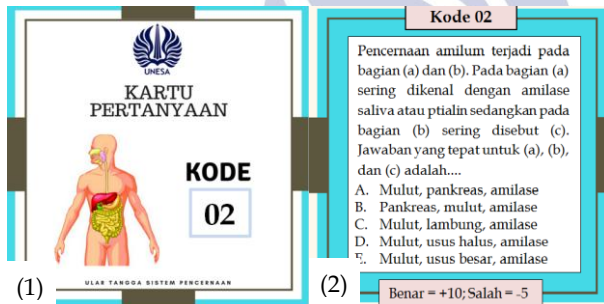


Figure 2. Question Card Design  
(1) Front (2) Back

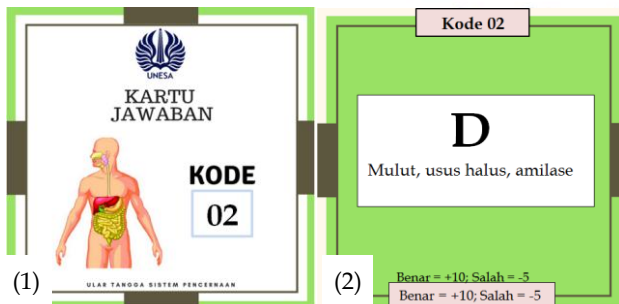


Figure 3. Answer Card Design  
(1) Front (2) Back

The usage of this media in a group is through group discussion. The media is expected to strengthen the students on the material of digestive system, so that students can achieve good results in the study. This is in accordance with the opinion of the Gunawan (2007)

who stated that learning while playing can create a fun learning that motivates student and make them understand the concept well. There is also a pawn as symbols of each player as well as instructions about rules of digestive system ladder snake media.

**b. The Validation Of Digestive System Ladder Snake Media**

The media has been developed through a process of validation by experts to obtain the theoretical feasibility. A valid media must meet the eligibility criteria of the display, format, content and characteristic. The validity of digestive system ladder snake based on an assessment of the validator are presented in Table 1.

Tabel 1. The Results Of Media Validation

No	Aspects	Score			Average	Feasibility (%)
		V1	V2	V3		
<b>Display (Visual)</b>						
1	Image Quality	4	4	4	4	100
2	Color	4	4	4	4	100
3	Clarity Of The Writing	4	4	4	4	100
<b>Format</b>						
1	Media Formats	4	4	4	4	100
2	Design and size of Media	4	4	4	4	100
<b>Content</b>						
1	Language	4	4	4	4	100
2	Sentence	4	4	4	4	100
3	Material	4	4	4	4	100
<b>Ladder Snake Digestive System Characteristics</b>						
1	Quality Of Materials	4	4	4	4	100
2	Use Of Media	4	3	4	3.67	91.7
3	The Contents Of Card Question	4	3	4	3.67	91.7
4	Clue Game	4	4	4	4	100
5	Game Rules	4	4	4	4	100
Total overall score		52	50	52		
The average		4	3.85	4		



No	Aspects	Score			Average	Feasibility (%)
		V1	V2	V3		
score each of the reviewers						
Score mode		4	4	4		
Feasibility aspects of each of the reviewers (%)						
		100	96.2	100		
The average score on the overall aspect						
					3.95 (Very Valid)	
Feasibility of overall (%)						
					99.17 (Very Good)	

*Description :*

V1 : *Media Experts*

V2 : *Media Materials*

V3 : *Biology Teacher*

The validity of digestive system ladder snake media obtained from the results of the 3 validators, two biology lecturers of UNESA and a high school biology teacher. Table 1 shows the average score digestive system ladder snake media validation with eligibility rate of 3.95 and 99.17% by category. The score is obtained from the average of 5 aspects which are the appearance, format, content and characteristic of the cooperation. An aspect of this validation assessment is in accordance with the opinion of the National Education Department (2004) that the validity of the learning media components in terms of card display includes a picture, color and writing. Based on aspects of the format and the content which includes the design, size, language, sentence and material. As well as the characteristic of the materials and quality as seen from the use of the media. In addition, cooperation components can also be declared valid if the instructions and regulations media appropriate for training group cooperation.

The display aspects obtained an average of 4. The results of the validation indicate that the display of ladder snake media meets all the criteria on the display which are clear image, the image relates to the material, the size of the image proportional so that it can be easily understood by students. According to Widjajanti (2008) learning through the use of images can convey message or content of the image is effective so that the images presented must be clearly visible. The selection of images used in accordance with the suggestion from thesis adviser that the image in accordance with sequence process on the digestive system. That aspect is

in accordance with one of the good media criteria which is image selection and the media display that has to be fit with the previously taught material in order to strengthening the concept (Sativa, 2012). Other display aspect is the appropriate combination of colors and attractiveness, as well as the size and type of the letter that can be read properly to attract the attention of the students to read the information on the learning media, so that students have the interest to read and give attention to the media used (Arsyad, 2009).

Aspects of the ladder snake media formats gained an average of 4. Criteria contained in the media formats include writing a systematic, consistent, tidy writing at media and attractive design that suitable with the paper size for the media. This statement is in accordance with the opinion of Arsyad (2009) that the media has the card components should be consistent, interesting and the letter format and size should be fitted.

Aspects of content about language, sentences and material obtained an average score of 4. The results show that the digestive system ladder snake media has the appropriate language with enhanced spelling, in accordance with the level of students thinking. A sentence that is easy to understand and does not give a double interpretation. Learning media are materials that have a clear sentence structure and easy to understand the language in accordance with the level of students thinking and do not have a double interpretation (Depdiknas, 2004). The material show that the digestive system ladder snake media has accordance with the competency base of 3.7 was associate between constituent organ and organ disorder by simulation on the material of digestive system.

Characteristics of digestive system ladder snake media has an average of 3.78. The quality of the materials obtained the maximum score due to material digestive system ladder snake media is durable. Learning media not easily broken and not easily fade ink has been in accordance with the statement of the Sativa (2012) that the media can be used as a medium of instruction in safe and harmless, a clear model, size proportionate, attractive and not easily damaged. On the use of media and content of question cards earn an average of 3.67 with a percentage of 91.7% eligibility. The maximum score was not achieved because there are some improvements in the use of the media and the contents of the card questions. On the use of the media criteria, the regulations to carry out the discussion groups before answering the question have not been

listed specifically in the regulations and steps of the game.

The repair is carried out in accordance with the advice of the validator to add regulation implementation discussions and clarify the use of the media to assess the group cooperation by adding form assessment of the group cooperation. The purpose of doing the improvement is that students can run games properly as expected by researcher. Characteristics and modifications are a reflection of the existence of learning media, resulting in its use as a tool to facilitate students in understanding and achieving the learning objectives (Diah & Zin, 2013).

Improvements should also be made on some cards questions in the code 16, 18, 21, 22 and 26. This is because there are some typos and concepts so that require improvement. These improvements aim to adjust the material on the question card and answer cards with the right concept so that students can achieve the learning objectives. The results of the assessment and advice that has been given by the validator in line with Arsyad (2009) that the media learning has several functions such as a cognitive function to achieve learning objectives.

Other forms of instructions characteristic aspects of the game instructions and game rules that pertained to cooperation activities. On the game instructions earns an average of 4. Based on advice from experts to make improvements on the game instructions in order to better reflect the cooperation through group discussion by adding some game rules such as dividing the players into a major player and companion player. There are also other improvements, such as the addition of the answer sheet as the track record of the game, discussion groups, list the score card judgment on the questions and answers and addition category of players as well as the granting of special rules on some swath.

On a patch of 6, 11, 17 and 23 were given additional special rules because there are pictures of the ladder as well as on a patch of 10, 22, 25 and 32 were also imposed special rules because there are pictures of the snake. A more specific explanation needed on that numbers so that there is no obstacle when the media used. The result of the improvement reflected a perfect score given by the validator. This shows that the digestive system ladder snake media has met all of the criteria through the game instructions and game rules that can be used to assess the collaboration of students. One element in the achievement of the learning is

cooperation. Through the cooperation of students can do a lot of activities and skills (Nurnawati *et al.*, 2012).

The acquisition of score is supported by improvements done based on advice from thesis advisor to provide images of the digestive system with the setting and sequencing the images corresponding to the digestive process so the display media arranged in neater and interesting way. Improvements based on suggestions of validators to improve the media size, the giving of limiter line, the display of question and answer cards to make it more varied and better in presenting the digestive system. Further improvements based on suggestions and feedback from validators to improve the content of the question fewer cards accordingly. Repairs done so that the card questions and answers snakes ladders digestive system containing information concerning the material properly and according to the indicators on the digestive system.

The existence of these improvements make the digestive system ladder snake media to be better stairs that corresponded to the learning objectives. It is in line with the opinion of Arsyad (2009), who stated that the media can be used as an intermediary delivery information from the source to the recipient if the media contains the purpose of teaching then it can be said as the learning media. Similar statements are also expressed by Mamonto (2013) which stated that all learning media is anything that serves as a means of contracting messages between teachers with students in the learning activities for the achievement of learning objectives.

The results of the validation shows that the digestive system ladder snake media has been qualified for a limited trial phase at the school to obtain empirical eligibility data.

## CONCLUSION

This study resulted snake ladder media to train cooperation and enhance the learning outcome of students on digestive system material 11th-grade senior high school based on expert validation result from the aspect of the appearance, format, content and characteristic that includes cooperation got 3.95 and feasibility of 99.17% percentage.

**SUGGESTION**

Based on the research that has been done, here are some suggestions that can be submitted for further research that is understanding the materials before using snakes ladders. In further research in order to access the entirety of the provision is to provide the material assignment. It is aiming to have all provision on base competency of 3.7 can be fulfilled properly.

**ACKNOWLEDGEMENT**

Thanks to the Ulfi Faizah, S.Pd., M.Si., Erlin Rakhmad Purnama, S.Si., M.Si. and Dwi Wahyuni, M.Si. who is willing to validate media developed.

**REFERENCES**

- Arsyad, A. 2009. *Media Pembelajaran*. Jakarta: PT. Raja Grafindo Persada.
- Chaudhary, A. G. 2010. Educational Gaming An Affective Tool for Learning and Social Change in India. *Journal of Creative Communication*, 5 (3), 135-152.
- Departemen Pendidikan Nasional. 2004. *Prinsip Penyusunan Bahan Ajar*. Depdiknas
- Diah, N. M., & Zin, N. A. 2013. Digital Game Based Learning Framework for Jawi Character Formation. *6th Annual International Conference on Computer Games, Multimedia and Allied Technology (CGAT 2013)*, 6-12.
- Gunawan, Adi W. 2007. *Genius Learning Strategy*. Jakarta : PT. Gramedia Pustaka Utama.
- Jaeng, M. 2007. *Belajar dan Pembelajaran Matematika*. Palu: FKIP UNTAD Press.
- Karimah, R. F. 2014. Pengembangan Pembelajaran Ular Tangga Fisika Siswa SMP/MTs Kelas VIII. *Jurnal Pendidikan Fisika*, 6-10.
- Kurnianita, E. 2016. Upaya Meningkatkan Kemampuan Kerjasama, Keaktifan dan Hasil Belajar Siswa Menggunakan Model Cooperative Learning Tipe CO-OP CO-OP pada Mata Pelajaran IPS Siswa Kelas VIII G SMP Negeri 1 Minggir Sleman. *Jurnal Pendidikan IPS*, 1-15.
- Mamonto, S. 2013. Penggunaan Media Pembelajaran Kelas XI di SMA Negeri 18 Surabaya. *Artikel E-Journal Unesa (online)*, 1-9. Diakses pada 28 Maret 2018.
- Nugrahani, R. 2007. Media Pembelajaran Berbasis Visula Berbentuk Permainan Ular Tangga untuk Meningkatkan Kualitas Belajar Mengajar di Sekolah Dasar. *Lembaran Ilmu Kependidikan* (36), 35-44.
- Nurnawati, E., Yulianti, D., & Susanto, H. 2012. Peningkatan Kerjasama Siswa Pembelajaran Kooperatif. *Unnes Physics Education Journal*, 1 (1), 1-7.
- Nugroho, A. P., Raharjo, T., & Wahyuningsih, D. 2013. Pengembangan Media Pembelajaran Fisika Menggunakan Permainan Ular Tangga ditinjau dari Motivasi Belajar Siswa Kelas VIII Materi Gaya. *Jurnal Pendidikan Fisika*, 1 (1), 11.
- Noemi, P. M., & Maximo, S. H. 2014. Educational Games for Learning. *Universal Journal of Educational Research*, 2, 230-238.
- Permatasari, T., Sri, K., & Kuswanti, N., 2013. Pengembangan Media Permainan Biology Racing Game Materi Sistem Pencernaan pada Manusia. *Jurnal BioEdu* 2(1), 84-87.
- Pramita, A.D., Kuswanti, N., & Indana, S., 2014. Validitas LKS Berbasis Model Learning Cycle 5-E pada Materi Sistem Pencernaan. *Jurnal BioEdu* 3(3), 375-381.
- Purwaningsih & Siti Maisaroh. 2017. Pengembangan Media Pembelajaran Ular Tangga Berbasis Pendidikan Karakter untuk Meningkatkan Prestasi Belajar IPS Kelas IV SD Donotirto Tahun Ajaran 2015/2016. *Jurnal PGSD Indonesia* 3 (1), 81-90.
- Riduwan. 2010. *Skala Pengukuran Variabel-Variabel Penelitian*. Bandung : Alfabeta.
- Rizkiyah, P., Raharjo, Faizah, U., 2015. "Validitas LKS Bermain Peran untuk Meningkatkan Hasil Belajar Siswa pada Materi Sistem Pencernaan". *Jurnal BioEdu* 4(1), 832-837.
- Sativa, D. Y. 2012. "Penggunaan Media Kartu untuk Meningkatkan Hasil Belajar XI IPA 2 SMA 1 Kolombo Sleman Yogyakarta". *Jurnal Universitas Negeri Yogyakarta*, 1-10.
- Sigh, S. 2014. Creating Joyful Learning Environment at Primary Level. *An International Journal of Education*, 4 (1), 10-14.
- Shitiq, H. A., & Mahmud, R. 2010. Using an Edutainment Approach of a Snake and Ladder Game for Teaching Jawi Script. *International Conference in Education and Management Technology (ICEMENT 2010)*, 228-232.
- Soekanto, Soerjono. 2006. *Sosiologi Suatu Pengantar*, Jakarta : PT. Raja Grafindo Persada.
- Umar. 2013. Media Pendidikan : Peran dan Fungsinya dalam Pembelajaran. *Jurnal Tarbiyah*, 10 (2), 126-141.
- Widjajanti, Endang. 2008. *Kualitas Lembar Kerja Siswa (LKS)*. (Makalah disajikan dalam seminar Pengabdian pada Masyarakat. Pelatihan Penyusunan LKS Mata Pelajaran Kimia Berdasarkan KTSP bagi Guru SMK/MAK pada tanggal 22 Agustus 2008). Yogyakarta: Universitas Negeri Yogyakarta.